Glaucoma Surgery During the COVID-19 Pandemic

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Disclaimer: The COVID-19 crisis is an evolving situation with rapidly changing knowledge, practices, limitations, and policies. The recommendations in this document are subject to change as the situation changes. These recommendations are merely guidelines and are not meant to be a substitute for the clinical judgment of the treating physician.

General Considerations

1. Guiding Principles
    a. Prevention of transmission of infection from patient to medical staff and vice versa.[1,2]
    b. Prevention of transmission of infection from patient to patient.[2]
    c. Prevention of harm to patients resulting from performing surgery on undiagnosed or pre-symptomatic COVID-19 cases.[3]
2. Potential Sources of Transmission of the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) During Ophthalmic Procedures
    a. Respiratory droplets are the primary mode of transmission.[1]
    b. Contaminated surfaces are a less important mode of transmission.[1]
    c. Although SARS-CoV-2 RNA has been detected in tears using polymerase chain reaction (PCR),[4] there is still no evidence on the presence of live virus in tears or the infectiousness of tears.
    d. There have been no reports of SARS-CoV-2 detection in the aqueous or vitreous humors or ocular tissues.[5]
3. Risk Stratification Based on SARS-CoV-2 Transmission[1]
    a. High risk for transmission
        i. Emergency procedures during this pandemic require that patients should be treated as potentially infectious. Due to exigency, these procedures would have to be done regardless of any symptom screening of SARS-CoV-2 testing.
        ii. High risk procedures (e.g. aerosol-generating procedures or AGP, surgeries involving the aerodigestive tract, etc.) on patients who tested positive on reverse transcription-PCR (RT-PCR) for SARS-COV-2.
        iii. Low risk procedures on symptomatic patients who tested positive on RT-PCR for SARS-CoV-2.
        iv. Patients in whom RT-PCR is recommended but cannot be done or results are unavailable at the time of intended surgery.
    b. Low risk for transmission
        i. Asymptomatic patients who will undergo low risk surgery.
        ii. Low risk procedures among symptomatic patients who tested negative for SARS-CoV-2 RT-PCR.
        iii. High risk procedure on symptomatic patients but SARS-CoV-2 RT-PCR is negative.

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4. Risk Mitigation Strategies

    a. *Pre-screening*. Screen patients by telephone before the day of surgery and again by questionnaire and temperature check upon arrival at the health facility. If the ocular condition allows it, postpone the procedure and refer the patient to the relevant isolation/ treatment area if the screening result is positive.[1,2]

    b. *Testing*. Testing asymptomatic patients without risk factors is impractical due to low yield and delay waiting for results.[2] Test patients who are symptomatic, have a high risk of having COVID-19 infection, or will undergo a high-risk procedure. In the context of glaucoma surgery, the only high-risk procedure is general anesthesia (intubation and extubation).[1,2,5]

    c. Observe proper *physical distancing* in the waiting area, pre-op holding area, and post-anesthesia care unit (PACU).[2]

    d. *Surgical Staff Personal Protective Equipment* [1,2,5]

        Recommended minimum surgical staff PPE for high-risk cases include the following: (1) a fit-tested N95 mask or any equivalent filtering facepiece respirator; (2) sterile, water-impermeable surgical gown; (3) face shield or goggles as long as the view through the surgical microscope is not compromised; (4) sterile surgical gloves, and (5) head cap.[1]

        Recommended minimum surgical staff PPE for low-risk cases include: (1) a surgical mask; (2) sterile, water-impermeable surgical gown; (3) face shield or goggles as long as the view through the surgical microscope is not compromised; (4) sterile surgical gloves; and (5) head cap.[1]

    e. *Surgical mask for patient*. Apply the mask over the oxygen cannula and tape the mask to the patient's face for local anesthesia cases.[2,5]

    f. *Povidone-iodine prep*. SARS-CoV-2 virus is inactivated by povidone-iodine, a standard part of preoperative preparation. Ensure adequate exposure of the ocular surface to povidone-iodine during antisepsis.[5]

    g. *Adhesive drapes* serve as an additional barrier between the patient's respiratory tract and the surgical staff.

    h. LASER room PPE can follow the same standards as outpatient clinics.[6] This includes surgical mask for the patient, surgical mask or N95 for the physician, and goggles or face shield (as long as the view through the equipment oculars is not compromised). Gloves and/or gown can be used if body fluid or mucous membrane exposure is expected. A breath shield may be installed on the laser slit-lamp as long as it does not interfere with the performance of the procedure. Disinfection of contaminated surfaces in the laser room can follow the same standards as outpatient clinics.[6] In particular, tonometer contact surfaces, contact lenses (e.g. used for iridotomy), and laser probes should be disinfected according to the manufacturer's or the institution's recommendations. Practice hand hygiene in the laser room before and after the procedure.

Specific Considerations

1. Filtration Surgery (Trabeculectomy, Drainage Device Implantation) Filtration surgeries should be of low risk to the surgeon. Povidone-iodine prep should be used in every case. Use of cautery should be minimized and performed after povidone-iodine and with vigorous irrigation.[5]

2. LASER Surgery

    a. It is not known to what degree the argon or YAG laser used in LASER iridotomy and iridoplasty can generate aerosol when it is focused and fired on the iris. Therefore, it would be prudent to apply a drop of 5% povidone-iodine after topical anesthesia and just before performing the procedure.[5]

    b. Topical povidone-iodine can be used prior to and during transscleral cyclophotocoagulation.[5]

3. Post-operative Care

    a. Practice the new standard infection control measures advocated for the clinic setting including wearing of surgical masks, hand

hygiene, proper disinfection of equipment especially the tonometer, use of cotton pledget to hold the eyelids, and proper handling of materials contaminated with tears or blood such as those used during periocular injections (e.g., fluorouracil and depot steroids).[6]

b. If possible, avoid using air puff tonometry due to the possibility of aerosol generation.[7]

c. Minimize the number of follow-up visits to only the essential number of visits.

d. Consider shortening the post-op visits by conducting the pre- and/or post-examination interview or discussion remotely such as by telephone.

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